

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/13766

A. CLASSIFICATION OF SUBJECT MATTER  
Int.Cl<sup>7</sup> F16J9/20, F02F5/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
Int.Cl<sup>7</sup> F16J9/20, F02F5/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Jitsuyo Shinan Koho 1926-1996 Toroku Jitsuyo Shinan Koho 1994-2003  
Kokai Jitsuyo Shinan Koho 1971-2003 Jitsuyo Shinan Toroku Koho 1996-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|-----------|---|-----------------------|
| X         | Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 190809/1983 (Laid-open No. 97345/1985) (Riken Corp.), 03 July, 1985 (03.07.85), (Family: none)   | 2-4                   |
| Y         |   | 1, 5, 6               |
| Y         | Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 140449/1980 (Laid-open No. 63951/1982) (Komatsu Ltd.), 16 April, 1982 (16.04.82), (Family: none) | 1                     |

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

|   |  |
|---|--|
| * Special categories of cited documents:  | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  |
| "A" document defining the general state of the art which is not considered to be of particular relevance  | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone   |
| "E" earlier document but published on or after the international filing date  | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "&" document member of the same patent family  |
| "O" document referring to an oral disclosure, use, exhibition or other means  |  |
| "P" document published prior to the international filing date but later than the priority date claimed  |  |

Date of the actual completion of the international search  
27 November, 2003 (27.11.03)

Date of mailing of the international search report  
09 December, 2003 (09.12.03)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|-----------|--|-----------------------|
| Y         | Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 402079/1990 (Laid-open No. 95169/1992) (Nippon Piston Ring Co., Ltd.), 18 August, 1992 (18.08.92), (Family: none) | 1, 5, 6               |
| Y         | JP 9-144881 A (Teikoku Pisuton Ringu Kabushiki Kaisha), 03 June, 1997 (03.06.97), (Family: none)   | 1, 6                  |